| Reg. No. | | | | | | | | | | |
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MANIPAL INSTITUTE OF TECHNOLOGY
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**DEPARTMENT OF MECHATRONICS**

**VI SEMESTER B.TECH. (MECHATRONICS)**

**END SEMESTER MAKEUP EXAMINATIONS, July 2022**

**SUBJECT: INFORMATION SECURITY FOR INDUSTRIAL AUTOMATION [MTE 4056]**

**(Date: July, 2022)**

**Time: 3 Hours** **MAX. MARKS: 50**

**Instructions to Candidates:**

- Answer **ALL** the questions.

| Q. No | | M | CO | PO | LO | BL |
|---|---|---|---|---|---|---|
| **1.** | Define and analyse the various critical components of an information system, as well as their security requirements. | **5** | **1** | **2** | **4** | **1, 4** |
| **2.** | Design a Pretty Good Privacy (PGP) service with the following features: confidentiality and compression. Describe each of the services in a design. | **3** | **2** | **3** | **5** | **6** |
| **3.** | "These hacker attacks originate from one attacker and are targeted to a known victim", justifies the assertion by choosing an appropriate hacking topology. | **2** | **4** | **2** | **2** | **5** |
| **4.** | Develop a generic PGP reception diagram that shows the interaction between the four services: signature, compression, confidentiality, and radix-64 conversion. | **5** | **2** | **3** | **5** | **6** |
| **5.** | Classify web security threats in terms of the location of the threat. | **3** | **2** | **1** | **1** | **4** |
| **6.** | Select and explain any four important features of IKE (Internet Key Exchange) key determination algorithm with respect to key distribution. | **2** | **4, 1, 3** | **2** | **4** | **2, 3** |
| **7.** | What is multilevel database? Write at least two proposals for multilevel security. | **5** | **4** | **2** | **4** | **1, 6** |
| **8.** | Based on hacking philosophy, list the largest subsects of hackers. | **3** | **4** | **2** | **4** | **4** |
| **9.** | Select and explain any two malicious code attack vectors with respect to IP scan and unprotected shares. | **2** | **1** | **2** | **4** | **2, 3** |
| **10.** | Create a Security Systems Development Life Cycle (SecSDLC). List all the steps of SecSDLC. | **5** | **1** | **1** | **3** | **4, 6** |
| **11.** | Select and explain any three categories of threat with respect to intellectual property, quality of service, and information extortion. | **3** | **1** | **2** | **4** | **2, 3** |
| **12.** | Enumerate two different ways of executing cybercrime. | **2** | **4** | **1** | **1** | **4** |

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|---|---|---|---|---|---|---|
| **13.** | Design a data encryption system (grayscale image encryption) that includes the following functionalities: zig-zag shuffling operation and xor-based diffusion operation. | **5** | **4** | **4** | **6** | **6** |
| **14.** | "A firewall defends a local system or a network of systems against network-based security threats. There are still some limitations", according to the assertation, list at least three limitations of firewalls in terms of security threat protection. | **3** | **3** | **2** | **2** | **4** |
| **15.** | Identify the four important functions that information security performs in an organization. | **2** | **1** | **2** | **4** | **4** |